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ABSTRACT

This annual report by the Developmental Mathematics Curriculum Committee (DMCC) of the American Mathematical Association of Two-Year Colleges (AMATYC) includes seven subcommittee reports. After introductory material, the annual report outlines the DMCC's goals, enumerates its objectives for 1981 through 1986, and establishes revised goals for the collection and exchange of program evaluation information and materials. The first report, by the DMCC Evaluation Subcommittee, begins with an evaluation model, details a five-year plan, and summarizes the results of a survey of course completion at 20 schools in 17 states. The report by the Handheld Calculator Subcommittee capsulizes the findings of studies of calculator use and impact in two-year co' eges. The Minimal Competency Subcommittee report establishes six objectives to be attained in identifying a minimum level of mathematics literacy for all college-level students. The Newsletter Subcommittee report briefly lists methods of facilitating information exchange between the DMCC and the AMATYC. The report by the Student Learning Problems Subcommittee details a five-year plan and presents results of an AMATYC membership survey conducted to identify perceived learning problems. The report of the Subcommittee on Teacher Qualifications provides recommendations for an AMATYC position statement on two-year college instructor qualifications. The Testing Subcommittee report lists goals to be accomplished in the identification of suitable tests. The concluding section highlights areas for further research. (KL)

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AMERICAN MATHEMATICAL ASSOCIATION OF TWO-YEAR COLLEGES

DEVELOPMENTAL MATHEMATICS CURRICULUM COMMITTEE

ANNUAL REPORT

OCTOBER 9, 1981

Patricia A. Dyer, Chairperson
Palm Beach Junior College South
Boca Raton, Florida 33431

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INTRODUCTION

The first academic committee established by AMATYC, The American Mathematical Association of Two-Year Colleges, the Developmental Mathematics Curriculum has completed seven years of activities and studies. Developmental mathematics is defined for the work of this committee to be arithmetic, basics of algebra, and some elementary geometry when studied in a postsecondary course or program. All research and other reports completed by the Committee are listed in the holdings of ERIC. Under developmental mathematics some authors are James Baldwin et al, Alice Berridge, Amber Steinmetz, and Patricia Dyer.

During these seven years the DMC Committee has evolved into a formal structure now addressing research questions and other interests through subcommittees working in specific areas. With long range goals and specific objectives identified for the Committee as a whole and for each subcommittee, the Committee works witnin their guidelines and a five-year plan. The first was developed early in 1977. Each year the Committee reports the progress/ results of the year's work at the annual meeting of AMATYC. As objectives are achieved, the plan is reviewed and revised.

During the 1980-81 year, several subcommittees have been active, while two others clearly identified and one with a set of objectives have not functioned. The subcommittees and chairs are listed in the Table of Contents. Complete reports along with a five-year plan, 1981-86, are included in this annual report. A brief overview of the subcommittee reports follows.

Evaluation (Model). Continuing its work on evaluation, this subcommittee reports on a completion survey done this year. The instrument used and the results are presented. "Evaluation" remains a topic of national interest, so this subcommittee has updated its working plan and will continue to research the several areas in an evaluation model identified earlier. That work is expanded on here. An evaluation model must include various components such as assessment of instructional effectiveness, assessment of attitudes, assessment of program design effectiveness and assessment of cost effectiveness.

Handheld Calculator. A series of surveys with respect to the use of the handheld calculator in the developmental mathematics curriculum program have been conducted over the last several years by this subcommittee. The last of the series was to be reported in this report.

Learning Problems. This is the newest of the subcommittees. It was established in October 1977. First, goals were identified and a working plan formulated. One of the subcommittee's first tasks was to identify and/or define what is perceived by the mathematics community to be mathematics learning problems. The results of this work are reported here and a revised plan is presented.

Minimal Competency. This subcommittee has not been active this year. However, the topic is still one of national prominence. One question to be addressed is whether or not minimal competencies for college students, that is college-level skills, should be addressed in a developmental mathematics curriculum committee.

Newsletter. This year the AMATYC Review has been used as a vehicle to report Committee work to the membership of AMATYC.

Teacher Qualifications. The last objective has been achieved this year by this subcommittee. A statement of recommended teacher qualifications for teachers of developmental mathematics curriculum in two-year colleges is presented to the membership as a proposed Association statement which AMATYC will publish.

Testing. This subcommittee has been in existence for several years. It completed its first set of objectives by October 1979. At that time it presented to the membership of AMATYC a set of validated test items which could be randomly retrieved for use by the tyc teacher. These have been on sale to the public, but the supply is exhausted. A new plan is presented by this subcommittee.

Developmental Mathematics continues to be an area of concern in two-year colleges. There are several areas in which work is still to be done. A number of subcommittees will continue work already underway. Some will revise their work plan and change direction, while others yet will be dissolved. New areas are proposed for research and study.

OFFICERS

Developmental Mathematics Curriculum Committee

Chairperson	Patricia A. Dyer Palm Beach Junior College South Boca Raton, Florida 33431
Co-chairperson	Ann Dice William Rainey Harper College Palatine, Illinois 60067
Secretary	Alice Berridge Nassau Community College Garden City, New York 11530
Subcommittee Chairpersons	See Table of Contents

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GOALS

DEVELOPMENTAL MATHEMATICS CURRICULUM COMMITTEE

--To develop awareness and understanding of developmental mathematics curriculum/ programs among two-year colleges and other interest groups.

--To increase communications among all those involved in developmental mathematics curriculum in higher education.

--To aid in the improvement of developmental mathematics curriculum programs and methodology in two-year colleges and their equivalent.

THE FIVE-YEAR PLAN, 1981-86

1. To provide information to two-year colleges and AMATYC members with respect to programs, research and new developments in developmental mathematics curriculum through research and other activities.

2. To provide workshops for DMC interest groups, including workshops in testing, evaluation, learning problems and other relevant topics.

3. To complete the design of an evaluation model for DMC including its multiple components. To make this model available to AMATYC members--both individuals and institutions. To provide a clearinghouse function collecting evaluation materials and reports and providing for the exchange of evaluation materials.

4. To design curriculum to meet the needs of persons in higher education not meeting minimal competencies for college-level skills--at college entrance, at third year entry, and at baccalaureate degree levels.

5. To develop a system for storage, sale and retrieval of the existing test item pool compatible with microcomputers now available on the market.

6. To develop and recommend DM Curriculum for technical mathematics programs.

7. To work cooperatively with groups interested in computers to develop computer applications to teaching and learning developmental mathematics curriculum.

8. To provide a regular DMC Committee column for The AMATYC Review to facilitate exchange of DMC news and information to the Committee and the AMATYC membership in general.

EVALUATION MODEL

The principal five-year goal for this committee continues to be the development of a practical guide for performing evaluations of developmental mathematics curriculum at many different colleges. A secondary goal is to establish a limited clearinghouse function to provide for the collection and exchange of evaluation information and materials. The revised objectives (1981-86) are:

1. Continue the pilot program established with selected schools collecting data with respect to assessment of

   instructional effectiveness
   attitudes
   program design effectiveness
   cost effectiveness

2. Continue to analyze and tally resulting data, compiling and making the results available to the AMATYC membership.

3. Establish a review board to appraise and critique standardized tests for developmental mathematics.

4. Serve a limited clearinghouse function to collect and exchange evaluation materials/reports and information.

5. Explore grants prospects in order to better achieve the goals of the Subcommittee.

6. Extend liaison contacts with national organizations to increase the exchange of information pertinent to evaluation topics.

7. Provide a greater communications exchange with AMATYC membership.

8. Refine the evaluation model. Develop specific guidelines for DMC programs and specific evaluation procedures.

Since 1978 the principal focus of this committee has been on student performance evaluation. Several tests used in the process were critiqued closely. A data base has been in the developing stages since 1979. One major source of data was from a group of participants at the AMATYC Rocky Mountain Mathematics Consortium Conference on Evaluation* in the spring of 1980. Data collection continues and other workshops are to be offered. During the 1980-81 academic year, the data collected was with respect to student completion of developmental courses. Performance and attitude studies are continuing.

*Write to Dr. Matthew Hassett, Arizona State University, Tempe, Arizona for the proceedings of this conference.

ANNUAL REPORT OF THE DMC EVALUATION SUBCOMMITTEE

by

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Sinclair Community College
Dayton, Ohio 45402

In order to focus the efforts of the Evaluation Subcommittee on the areas of greatest interest, a review of continuing and future activities pertinent to this group was undertaken by members attending the 1980 annual AMATYC meeting and continued by correspondence with other members immediately thereafter. From this project a revised list of objectives was developed that would reflect, not only the changing needs of Subcommittee members, but also furnish direction for the next five years.

This is detailed in the working plan which follows.

1. The evaluation model has been redefined. Specific guidelines for DMC programs and specific evaluation procedures will be based on these areas of assessment with respect to the populations or topics listed under each.

    a. Assessment of Instructional Effectiveness

        Students: gain scores, completion rates, follow-up success and other measures.
        Faculty
        Resources

    b. Assessment of Attitudes

        Students: toward program and toward mathematics
        Faculty: within program and outside program
        Administration: within program and outside program

    c. Assessment of Program Design Effectiveness

        Curricular evaluation
        Materials evaluation
        Instructional technique evaluation

    d. Assessment of Cost Effectiveness

2. Continue the collection of data.

3. Establish a review board to appraise and critique standardized tests for developmental mathematics.

4. Establish a limited clearinghouse function to collect and exchange evaluation materials/reports and information.

5. Explore grants prospects in order to better achieve the goals of the Subcommittee.

6. Extend liaison contacts with national organizations including NCTM, MAA, NARDSPE. Cultivate a group of members who are experienced in evaluation techniques to provide assistance--a network of evaluation "experts."

7. Extend communications with AMATYC membership by using the annual report of the DMC Committee, regular notices in the AMATYC Review, regional newsletters and through the Executive Board.

The main thrust is directed toward the complex objective represented by a proposed evaluation model. The intent of the Subcommittee is to develop guidelines illustrative of the major divisions noted under that heading. At this time, coordinators for each division are surveying already existing instruments or materials that may be utilized to reflect those specific topics. After securing permission, groups of Subcommittee members will be surveyed for evaluation of developmental mathematics courses/programs. The information thus gathered will permit the development of a series of options under each division from which an evaluator could select the measure that is most appropriate for his/her particular setting.

Efforts have been initiated to collect reports of evaluations of developmental mathematics programs already completed. When acquired, these reports will be available for loan to AMATYC members.

Monitoring of grants currently offered through governmental or private funding is being conducted on a continuing basis by Subcommittee members. Receiving monies from such sources seems unlikely at this time.

Since evaluation topics remain an important issue on the educational scene, contacts have been established with other organizations concerned with either developmental education or mathematics. We anticipate an interchange of information helpful to all groups.

As a continuing study related to the model, the survey form requesting completion statistics (attached) was revised slightly and distributed to different institutions. Results reported by 20 schools from 17 states scattered nationwide show that arithmetic and beginning algebra are the two mathematics courses most often developmental. In the arithmetic area, a scheduled lab format is the most

popular instructional technique with a total of 1,369 students receiving credit or a combined total of 2,596 listed under either lecture, lecture/lab, or open lab designations. The open laboratory format, although reporting the smallest number of students overall enrollment of 366, produced the highest success rate of 77%. Scheduled labs with 1,928 students had a 71% success rate; lecture/lab had 932 students with a 67% rate and lecture with 473 students and the same 67% rate.

From developmental algebra statistics, the lecture/lab format is most popular registering 1,528 students of whom 864 received credit for a success rate of 57%. Lecture alone reported 1,084 students with 839 receiving credit at a 77% rate. The scheduled lab format produced 260 successful students out of 287 for the best success rate of 97%. The open lab format produced 93 successful students out of 107 reported for an 87% success rate.

Withdrawals during the term in either course were not counted as not receiving credit. No schools reported using tutorial only for instruction.

Developmental Math Committee
Evaluation Sub-Committee

Completion Survey
Spring 1981

American Math Association
of Two-Year Colleges

I. Do you measure completion rates for Developmental Math courses? YES_____ NO_____
If yes, please indicate how you calculate those rates:_____

_____

_____

II. If you record other evaluation measures, please describe:_____

_____

_____

III. We would appreciate having the information shown on the following chart for the current _____ semester _____ quarter.

You may use the following key to indicate class structure in the second column: L = Lecture; L/L = Lecture/Lab; SL = Scheduled Lab (student registers for specified class time); OL = Open Lab (student registers and arranges sessions); T = Tutorial (assistance provided upon student or instructor request); If other than these please describe:

Course Name	Class Structure	Total Registered for Term	Total Withdrawn During Term	Total Receiving Credit					Total Receiving No Credit		
				A	B	C	D	S or Audit	Incomplete	In Progress	F
1.											
2.											
3.											
4.											
5.											

Please return by June 30, 1981 to:
Jack C. Sharp, Jr.
Division of Special Studies
Floyd Junior College
Rome, Georgia 30161

Submitted by:
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HANDHELD CALCULATOR

The handheld Calculator Subcommittee has conducted a series of studies since 1977. These were diversified and included the collection of information from two-year colleges nationwide with respect to the use of handheld calculators in their classes, a comparison study of student performance, and a study of student attitude.

The first of these was summarized in the DMC Committee Annual Report, 1978. The majority of the 109 respondent schools in this information survey reported no established school policy or the use of the handheld calculator in mathematics courses. As many as 78 said that they permitted their use in mathematics courses with less than 50 schools permitting use in arithmetic and basics of algebra courses. An interesting statistic was that 96 schools permitted students to use handheld calculators in classroom activities and in homework preparation but only 80 permitted use in testing situations. This is interesting in that only 78 said calculator use was allowed. The survey concluded that use of the calculator created more interest on the part of the student in mathematics but that there was no evidence that computational skill was affected either way. It was generally believed that calculator use did not hinder the student's desire to master basic concepts and that it did help the student solve more problems at all levels of two-year college mathematics including developmental. Of the responding schools, 28% furnished handheld calculators for student use.

In the 1979 Annual Report was the summary of a study comparing the performance of two groups of students in basic mathematics in a technical college. The null hypothesis was "there is no significant difference in student performance (measured by final examination scores) between two groups taught by the same method, one permitted to use handheld calculators and one not."

Neither group of students was permitted to use calculators in the final examination. The study was well controlled. Students were matched on the basis of pretest scores. The results of study produced the conclusion "reject the null hypothesis."

The last of the series, a student attitude study, has been conducted during the two-year period 1979-81. Done in conjunction with a performance comparison with a broader population and larger sample, the results will be attached to this Report as an appendix.

The original goal of this Subcommittee was to arrive at a statement of policy for AMATYC with respect to the use of the handheld calculator in developmental mathematics courses through the activities detailed above. The subcommittee has concluded as a result of the studies completed that such a policy is unnecessary. With the reporting of the student attitude study, the Subcommittee has concluded its planned activities.

MINIMAL COMPETENCY

The earliest work of this subcommittee was an attempt to identify minimal mathematics competencies for two-year college graduates. In doing this, that first committee decided that one set of competencies would not serve all students, so three categories of graduates were established as the basis for further work.

However, other philosophical considerations arose and have had to be dealt with. One is the question, can there be identified a common mathematical core extending beyond basic computational and/or survival skills which all students attempting college-level work should be able to demonstrate? A second consideration is whether it is the domain of a developmental study group to determine minimal competencies for two-year graduates or the concern of a broader group that is not limited.

The Minimal Competency Subcommittee is a developmental mathematics curriculum group. That is, its chief interest areas have been limited to arithmetic, pre-algebra and the basics of algebra. Perhaps its work is to determine the level of competencies which would indicate that a student is in need of work in the developmental area and address the curriculum questions which arise there.

This concern does not mean that the determination of minimal competencies for two-year and four-year graduation is not important. In the initial survey, 85% of the 207 two-year college respondents in 1978 indicated a belief that there is a need for a minimal competency requirement in higher education. It is clearly an area in which AMATYC and the DMC Committee has work to do. For the coming five years, the following goals and objectives are proposed for the Minimal Competency Subcommittee.

Goal: To identify a level of common mathematical literacy extending beyond basic computational and/or survival skills which all students attempting college-level work should be able to demonstrate.

Objectives:

1. Identify the competencies now considered essential at different levels of education, such as high school graduation, associate degree level, and baccalaureate degree level. Different groups--states, national organizations, and individual institutions should be canvassed to determine what has been established already and what is required of students.

2. Canvass two-year college teachers of mathematics to determine their support of the need for the identification of different levels of competencies in mathematics and to determine their support for a common level of mathematical literacy.

3. Limit the work of this subcommittee to the competencies which would be addressed in the curriculum of developmental mathematics.

4. Provide a forum for the exchange of views concerning the need for the identification of minimal competencies and the manner in which the requirement that students meet them or demonstrate them be carried out.

5. Disseminate the information collected on minimal competencies to the membership and to the mathematics public by way of The AMATYC Review, regional vice presidents' newsletters and other journals as appropriate.

6. Establish an AMATYC position with respect to minimal mathematics competencies.

Minimal competency discussions seem to lead immediately to discussions of testing or test construction. There is no necessary connection between the two, that is, establishing competencies and writing tests. It is understood that there must be a vehicle for demonstrating whether or not a student has achieved a level of minimal competency, but the work of this subcommittee is to identify competencies.

When this subcommittee has completed its work in the identification of these competencies, it is recommended that the work be passed on to the Testing Subcommittee and the Evaluation Subcommittee or that they all three work cooperatively toward the measurement of competencies. Testing for minimal competency and placement assessment can be addressed at the same time, with the results of minimal competency testing being used to place students in developmental courses as indicated by the test outcomes.

NEWSLETTER

During this past year the newsletter function has been served through The AMATYC Review, supplying news and information about DMC Committee activities to the AMATYC membership. Further, Newsletter Subcommittee chairperson Alice Berridge reports "Jim (Baldwin) and I arranged to have the ERIC bulletin* reprinted. That's the one which highlighted the original DMC Committee survey. . . . I have permission in writing from ERIC to do the duplicating." Berridge is arranging for 600 copies.

For the future the following goal and objectives are suggested.

Goal: To provide a news and information exchange specifically for the Developmental Mathematics Curriculum Committee to the membership of AMATYC.

Objectives: To provide this service through

1. The AMATYC Review, by writing a regular column.
2. the Executive Board of AMATYC and the regional vice presidents' newsletters.
3. such other special projects as are deemed feasible.

*Editor's note: ERIC Junior College Resource Review, August 1979, Developmental Mathematics.

STUDENT LEARNING PROBLEMS

While not principally a curriculum concern, learning problems, whether for mathematics or other discipline areas, is always a subject of concern for the educator. In mathematics, it has become one of the most urgent topics in recent years. This concern has risen out of the national focus on functional literacy for high school graduation and essential academic skills for college-level students. Where states have attempted functional literacy testing, the preliminary tests had high failure rates in mathematics. Out of this occurrence has grown the thrust toward identifying college-level essential skills.

The question, "Why are students not learning enough mathematics to be 'functionally literate' in mathematics?" has increased the effort to identify sources of the problem. Is it the school, the classroom, the teacher, student ability, or other, such as learning problems.[2]

In 1979 the DMC Committee established this Subcommittee to address the subject of Student Learning Problems. Initially, the subcommittee developed its goals and a working plan to achieve them. This included the identification of perceived learning problems and an inventory of solutions. One phase of this process is complete. The results of the survey of the membership of AMATYC identifying perceived learning problems is included with this report. The inventory of solutions is underway, and the working plan for 1981-86 is prepared.

Five-Year Plan, 1981-86--Goals and Objectives

1. To identify the major areas of student learning problems by

   i) a search of the available literature.
   ii) a survey of students.
   iii) communications with other organizations working in the area of student learning problems.

2. To search for methods to correct these problems through

   i) techniques of effective teachers.
   ii) results of research as found in the literature.
   iii) communication with non-mathematics organizations working on solutions to specific problems.
   iv) communication with other mathematics groups working on solutions to learning problems.

3. To disseminate the finding to the membership of AMATYC by

i) workshops at the national annual meeting.
ii) the annual report of the DMC Committee.
iii) a bibliography or summary of important sources of information in the area of student learning problems.
iv) articles in The AMATYC Review and other journals.

ANNUAL REPORT OF THE STUDENT LEARNING PROBLEMS SUBCOMMITTEE

by
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Northampton County Area Community College
Bethlehem, Pennsylvania 18017

During the past year the Subcommitte has completed the survey on Student Learning Problems and what is being done to ameliorate the situation. This questionnaire was distributed to the membership of AMATYC. The final tally is attached.

As a result of this survey the Subcommittee has started to compile a resource file which is being edited by Naomi Yanis. In addition, the Subcommittee members shared among themselves articles and conference notices apropos student learning problems.

Topics of interest to the Subcommittee and possible speakers for this conference were forwarded to the Program Chairperson.

SUMMARY

SURVEY FOR LEARNING PROBLEMS SUBCOMMITTEE

Fall, 1980

(1) Identify the major areas of student Learning Problems as you perceive them.

a.	Weak background in mathematics	32
b.	Lack of purpose/poor attitude (motivation)	23
c.	Poor study habits	20
d.	Lack of or poor ability in problem solving	19
e.	Poor reading ability	19
f.	Math anxiety	17
g.	Lack of or poor ability to abstract	11
h.	Lack of or poor ability to generalize	10
i.	Busy schedule	8
j.	Poor retention	7
k.	Lack of or poor ability to analyze	7
l.	Instructor approach	5
m.	Placement	4
n.	Lack of or poor ability to manipulate	3
o.	Instructional materials	3
p.	Learning Disabilities	3
q.	Sight/hearing problems	1
r.	Lack of program evaluation	1
s.	Emotional problems	1

(2) What suggestions for correcting these problems can you offer?

a.	Improve study habits	9
b.	Improve placement	9
c.	Improve student motivation	9
d.	Review basics/drill and practice	8
e.	Refer students to counselors, specialists	8
f.	Individual help	7
g.	Teach problem solving/higher order thinking	7
h.	Use math lab	7
i.	Improve elementary and secondary instruction	7
j.	Provide quality instruction	6
k.	Mastery learning	6

(See Over)

(2) Continued

l.	Use tutors	5
m.	Use better instructional materials	3
n.	Use small group instruction	2
o.	Use computers, other media	2
p.	Individualize instruction	2
q.	Self-pacing	2
r.	Set up math anxiety clinic	2
s.	Reading instruction	2
t.	Improve program evaluation	1
u.	Improve math notation	1
v.	Present material from concrete to abstract	1
w.	Have "expert" teachers train other teachers	1
x.	Improved financial aid	1
y.	Make math fun	1
z.	Study cognitive styles	1
aa.	L.D. Training for faculty workshops	1

ANNUAL REPORT OF THE SUBCOMMITTEE ON TEACHER QUALIFICATIONS

by

Ronald Adams
Yavapai College
Prescott, Arizona

During the 1980-81 year the committee concentrated its efforts on the final objective which was to "establish AMATYC recommended qualifications for DMC teachers and publicize".

To this end the committee presented a set of recommendations at the DMC meeting during the 1980 annual AMATYC convention and received approval to distribute those recommendations to the AMATYC membership for approval, rejection, or alteration (see attached copy of the recommendations).

Those recommendations were mailed to the membership during the Spring semester (with tremendous assistance from Pat Dyer), with instructions that responses be submitted prior to June 15. A total of 64 responses were received. 31 responses were unqualified approvals of the set of recommendations, 21 were qualified approvals with specific suggestions for change, and 12 stated serious objections to all or most of the recommendations.

Based on the reactions received a revised set of recommendations were drawn and finalized at the subcommittee's meeting of Thursday, October 8, and are presented to the DMC for approval. This final set of recommendations will then be presented at the Delegate Assembly Friday, October 9 as the official AMATYC position with regard to teacher qualifications for two-year colleges. In the event that the Delegate Assembly approves this position all objectives of the subcommittee will have been met, and it is the recommendation of the chairperson that the subcommittee be dissolved. Should the Delegate Assembly reject the position statement, the activities of the subcommittee should continue until such time that an acceptable AMATYC position has been established.

SUBCOMMITTEE RECOMMENDATIONS
PRESENTED TO AMATYC MEMBERSHIP

Job vacancies in mathematics departments should identify positions which require all or some teaching of developmental mathematics courses, and for such vacancies

1) The institution should state that the teaching of developmental mathematics requires special training or equivalent experience and that individuals lacking this training or experience will not be assigned teaching responsibilities in developmental mathematics whenever possible.

2) Course work or special training in problem solving, teaching strategies, and methods of instruction for developmental students will be identified as essential rather than desirable qualifications.

Institutions offering courses in developmental mathematics should:

1) Encourage and reward participation in workshops and in-service programs which provide training in teaching the developmental student by all faculty who are assigned to teach developmental mathematics courses.

2) Recognize research and publication in the area of developmental mathematics as highly professional and of significant influence for promotion and tenure decisions.

Institutions offering graduate programs in mathematics and mathematics educations should:

1) Recognize the teaching of developmental mathematics as requiring specialized training and provide such training for the TYC mathematics faculty member.

2) Recognize the importance of an internship program for the graduate student seeking future employment as a teacher of developmental mathematics.

AMATYC Position Statement
on Teacher Qualifications
for Two-Year Colleges

Whereas:

1) Teaching developmental mathematics* requires special skills gained through experience or training including but not limited to problem solving techniques and alternative teaching strategies, and

2) Most personnel employed to teach mathematics at two-year colleges and some personnel employed to teach mathematics in four-year colleges and universities will at some time teach developmental mathematics courses*,

It is the position of AMATYC that:

1) Institutions employing teachers of mathematics should:

   a) Encourage and reward all faculty employed to teach mathematics for participation in workshops, in-service programs, or courses which provide training in those special skills necessary for teaching the developmental mathematics student,

   b) Provide those faculty lacking experience or training in teaching developmental mathematics students supervision by experienced personnel until such time that they have developed those special skills,

   c) Recognize research and publication in the area of developmental mathematics as highly professional and of significant influence in promotion and tenure decisions.

2) Institutions offering graduate programs in mathematics, mathematics education, and higher education should:

   a) Recognize the teaching of developmental mathematics as requiring specialized skills by providing appropriate training to those students desiring to teach mathematics at a two-year college,

   b) Recognize the importance of practicing those specialized skills by providing internship programs as an integral part of the course of study.

*Developmental mathematics for the purpose of this position statement is restricted to Arithmetic, Pre-Algebra, and a first course in Algebra.

TESTING

In 1979 under the leadership of Ann Dice, Harper College, this subcommittee had ready for the membership of AMATYC a pool of 600 validated test items. They were organized for random selection for test construction. The entire stock of these sets of rest items has been exhausted.

During the past two years this subcommittee has not functioned since it had achieved its principal goal. However, since testing of various types is still a matter which has national attention, it is proposed that the Testing Subcommittee reorganize and pursue the following goals.

1. Transform the test items to a new format, such as microcomputer "diskettes."

2. Explore the construction of tests for measuring minimal competencies and for placement assessment.

3. Identify suitable tests for placement assessment for developmental mathematics courses and compile a resource file for the membership of AMATYC.

4. Identify tests suitable for measuring minimal competencies and compile a resource file for the membership of AMATYC.

It is recommended that the subcommittee prepare a working plan for 1981-86 to accomplish these goals. The proposed goals provide an opportunity for cooperative efforts between the DMC Committee and the AMATYC Computer Committee and among the DMC Subcommittees--Testing, Evaluation Model, and Minimal Competency.

CONCLUSION

In reviewing this report, the conclusion emerging most startlingly is that a wealth of research is waiting to be addressed. For persons pursuing graduate degrees or for other persons working toward improvement of teaching, of curriculum or of mathematical programs, an abundance of research ideas are suggested.

The Evaluation Model Subcommittee has several projects planned in the development of the evaluation model alone. These include the assessment of instructional effectiveness through studies of student gain scores, completion rates and follow-up success rates; the assessment of attitudes in students, faculty and administration toward a developmental program and toward mathematics; assessment of program design; and assessment of cost effectiveness.

The Student Learning Problems Subcommittee is another that has a number of projects to do. The search for methods to correct learning problems is a very broad topic. One possible type of study would involve the identification of a potential method which would then be tested to determine its effectiveness. When a sufficient number of methods are tested, workshops at the annual meeting of AMATYC are planned in order to teach and share what has been learned in the process.

The Handheld Calculator Subcommittee has completed its work, but in doing so it has raised more questions than it has answered. For the interested researcher, numerous questions about teaching developmental mathematics with or without handheld calculators remain. Does the use of handheld calculators in developmental mathematics classes affect computational skill? Are handheld calculators in the developmental mathematics classroom a help to students? What is the effect of the student being permitted to use handheld calculators during tests?

Minimal competencies are a national ISSUE. How can they be determined? How can they be measured? How can it be determined that such a thing is of value to a college graduate? to a college student?

Placement assessment is another current national issue. Should it be required at college entrance? What kinds of assessment should be used, if any? Should testing be included? What can be relied upon?

On the basis of what is reported here, the conclusion is that while numbers of research projects have been concluded, and some questions have been answered, with each answer more questions are generated. For the future, a greater need than ever is foreseen for information sharing and research in developmental mathematics areas.

The Committee accepts and approves the recommendations to dissolve the Handheld Calculator Subcommittee and the Teacher Qualifications Subcommittee. The Committee recommends that new work be started by the Testing Subcommittee and the Minimal Competency Subcommittee, and that new subcommittees be considered. It is urged that groups be formed to explore the needs of developmental mathematics in the areas of Computers and Technical Mathematics. At the next annual DMC Committee meeting, sets of goals and objectives which include a five-year working plan are to be presented, if the decision is made that there is sufficient interest to pursue work in these areas.

Finally, it is concluded that two-year college researchers are sorely needed for the work of this Committee. Each Subcommittee needs people who have an interest in its specific topic to aid in the continuance of the work at hand. A person need not already be "experienced" in research. It is a function of the Committee and the Subcommittee to work as a group to establish the kind of activity that is needed and do whatever "in-service" training needed to accomplish the research project proposed as part of the subcommittees' working plans.

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